AMENDMENTS TO THE TITLE:

Please amend the title as follows:

BANDWIDTH ALLOCATION AMONG CURRENT SYSTEM USERS BASED ON RELATIVE USER DEMAND AND BANDWIDTH AVAILABILITY

AMENDMENTS TO THE SPECIFICATION:

Page 1, immediately preceding the paragraph commencing "This invention relates to the allocation..." insert the following heading and sub-heading:

BACKGROUND

1. Technical Field

Page 1, immediately preceding the paragraph commencing "With the introduction of broadband connectivity..." insert the following sub-heading:

2. Related Art

Page 1, paragraph commencing at line 20:

In this specification, the term "N_{tot}" is used for the number of users to whom the service is potentially available, whether currently on line or not, and "N" will be used for the number of users currently on line. Contention ~~rations~~ ratios are conventionally calculated on the former figure.

Pages 3-4, immediately preceding the bridging paragraph, insert the following heading:

BRIEF SUMMARY

Pages 3-4, bridging paragraph:

The present invention addresses this by providing a method of controlling access to a communications resource in which the maximum capacity made available to each of a plurality of users bears an inverse relationship to the usage of the resource made by that user over a previous period, relative to the usage made by the other users.

Page 4, 1st full paragraph:

Preferably the method comprises the steps of:

- measuring the usage of the resource made by each user over a predetermined period,
- ranking the users according to the measured usage, and
- restricting the availability of resource to each user by allocating a restriction factor to each user according to that user's ranking.

Page 5, immediately preceding the 1st paragraph, insert the following heading:

BRIEF DESCRIPTION OF THE DRAWINGS

Page 5, 1st paragraph:

An embodiment of the invention will now be described, by way of example, with reference to the drawings, in which:

Page 5, amend the brief description of the drawings commencing at line 3 as follows:

Figure 1 is a schematic diagram illustrating the access network connecting users to the internet;

Figure 2 is a schematic diagram showing the functional elements that co-operate in the embodiment[[,]];

Figure 3 is a flow chart showing the principal steps of the operation of the embodiment[[:]];

Figures 4 to 9 show the results of a simulation of the use of the invention, and comparative results for a prior art system. More specifically:

Figure 4 shows a distribution of broadband usage used in the simulation[[.]];

Figure 5 shows the variation in usage between "peak" and "off-peak" time[[.]];

Figure 6 shows a ~~Frequency~~ frequency distribution of users as a function of how much capacity they require and obtain, in a prior art system[[,]];

Figure 7 shows a correlation between requested capacity and overall satisfaction index in the prior art system[[,.]];

Figure 8 shows the correlation between requested capacity and overall satisfaction in a system according to the invention[[.]]; and

Figure 9 shows a ~~Frequency~~ frequency distribution of subscribers as a function of their satisfaction index, for both the prior art system and the system according to the invention.

Page 5, immediately preceding the paragraph commencing at line 21, insert the following heading:

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

Page 6, paragraph commencing at line 25:

The ~~server~~ functional module 20 identifies all users in the defined group who are online at any given time and stores their identities in the register 26 (step 30). The register retrieves the usage data for these users from the store 25 (step 31) and attributes each user a priority (step 32) on the basis of that data. In the present embodiment, this priority is based on a simple inverse function of the amount of bandwidth that they have consumed over a given period, selected to be sufficiently short to respond promptly to changes in behaviour without reacting to every individual download. The period used in the simulations discussed below was 24 hours.

Page 8, paragraph commencing at line 9:

Even though the simulation is based on a simplified scenario that falls a long way short of taking into account the complexity of activity patterns, several details have been included so as to increase overall realism. At present, every 24h cycle is divided into "peak" and "off-peak" time. As the objective is to model home usage, the period running from 00:00 to 16:00 is considered "off-peak", with the maximum load being expected between 16:00 and midnight. Every user is attributed a fixed probability of drawing upon the shared bandwidth (i.e. attempting to download) during "peak" and "off-peak" period.

Each probability is pseudo-randomly generated so as to produce a plausible continuous distribution of profiles, from the occasional user to the compulsive bandwidth consumer whose connection is in a permanent "download state". Figure 4 shows the frequency distribution of simulated subscribers as a function of their probability to be engaged in an activity generating heavy traffic, respectively at "peak" and "off-peak" times. The model currently assumes a low contention ratio of 10:1, meaning that up to 10% of all users can be using their connection at maximum speed simultaneously before congestion problems arise. This generous hypothesis (real contention ratios are typically between 20 and 50:1) is counterbalanced by the fact that average network usage is also unusually high. Indeed, parameter values result in an average ~46% of all subscribers attempting to download simultaneously at "peak" time and ~22% "off-peak" (see ~~Figuse~~ Figure 5). This "double exaggeration" is intentional and is meant to anticipate the future situation where high-speed connections have become so ubiquitous that applications like video streaming are commonly used in everyday home activities. However, it does not reduce the applicability of the model to other, more contemporary scenarios, provided that an increase of the contention ratio is accompanied by a decrease in average usage.